

NEW HYDROBIID SNAILS
(MOLLUSCA: GASTROPODA: PROSOBRANCHIA:
TRUNCATELLOIDEA) FROM NORTH AMERICA

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Abstract.—The following new species of Cochliopinae (Prosobranchia: Hydrobiidae) are described: *Aroapyrgus polius* from Mexico; *Cochliopa perforata* from Costa Rica; *Heleobops clytus* from the Dominican Republic; *H. torquatus* from Jamaica; *Lithococcus aletes* from Costa Rica; and *Littoridina microcona* from Costa Rica. In addition, the following new genera and species are described: *Mesobia pristina* from Honduras; and *Texapyrgus longleyi* from the United States (Texas).

The following new aquatic snails are described as preliminary to a generic review of the Cochliopinae¹ Tryon, 1866 (Hershler & Thompson 1991). These novelties represent major geographic range extensions for their respective genera, or they will be used as the basis for anatomical descriptions of taxonomic importance.

The new taxa are differentiated from either related genera or other congeners. While provision of anatomical data largely is limited to descriptions of the new genera, it should be noted that generic placement of

the other new species was confirmed by study of soft parts when available.

Material studied is housed in the National Museum of Natural History (USNM) and Florida Museum of Natural History (UF). Shells were measured using WILD M-5 and M-7 dissecting microscopes equipped with ocular micrometers. Measurements are standard and have been converted to mm. Abbreviations are as follows: SH = shell height; SW = shell width; ApH = aperture height; ApW = aperture width; HBW = height of body whorl; WBW = width of body whorl; WH = whorls. The diameter of the apical shell whorl was measured perpendicular to the initial suture.

Family Hydrobiidae Troschel, 1857
Subfamily Cochliopinae Tryon, 1866
Aroapyrgus polius, new species
Fig. 1, Table 1

Description.—Shell medium-sized for the subfamily Cochliopinae, about 2.9–3.7 mm tall in adults; without obvious sexual dimorphism. Elongate-ovate with an obtuse apex. Width/height 52–63%; thin and transparent; smooth; teleoconch sculpture of very fine collabral striations. Periostracum gray. About 4.6–5.4 whorls in adult specimens; whorls inflated with a deeply impressed suture. Apical whorl low protruding; about

¹ The group of predominantly New World genera of Hydrobiidae united by possession of a sperm tube in the female genital tract (partly or completely separated from the glandular oviduct) and with male penis often having apocrine glands or papillae has been accorded subfamilial status by most recent workers and usually is referred to as the Littoridininae. However, the oldest available and therefore the valid name for this group is Cochliopinae Tryon, 1866. Authorship of Littoridininae has been attributed to Gray, 1857 (without complete literature citation) by several workers (Parodiz 1969:214, Golikov & Starobogatov 1975:211, Ioganzen & Starobogatov 1982:1144, Ponder & Warén 1988:297), but in Gray's works invariably he included the type species of *Littoridina* in the genus *Littorina* (Littorinidae) and we have found no evidence that he ever created a family-group name based on this hydrobiid. The earliest such name based on *Littoridina* is Littoridineae Thiele, 1928.

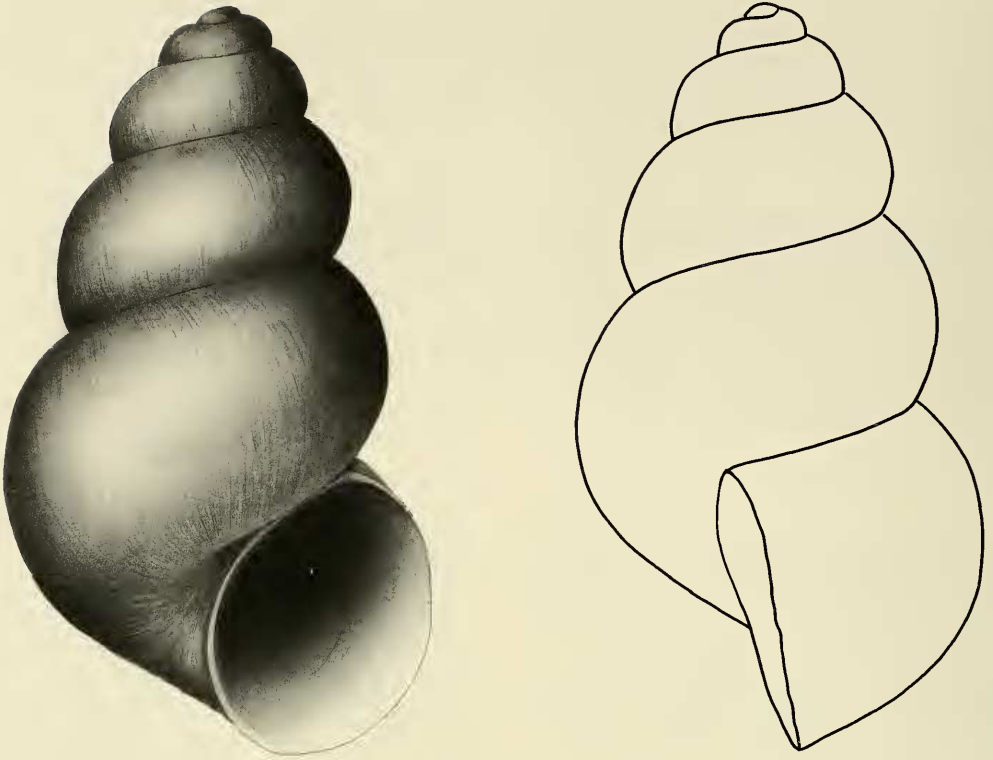


Fig. 1. *Aroapyrgus polius*, new species, holotype, UF 175028. Shell height, 3.7 mm.

0.23 mm in diameter. Umbilicus perforate; slightly obstructed by columellar lip. Aperture 37–41% of shell height; broadly ovate; width/height 80–85%; with an obtuse angle at the posterior corner. Aperture prosocline, inclined at 21–26° to coiling axis. Peristome complete across parietal margin of aperture, attached to previous whorl. Outer lip simple and thin; neither reflected nor thickened in-

ternally. Outer lip straight in lateral profile. Operculum thin, transparent, corneous; paucispiral, consisting of three rapidly expanding whorls; nucleus eccentric.

Type locality.—A small spring-fed pool 3.5 km northeast of Tamazulapan del Progreso, Oaxaca, Mexico; 2100 m elevation. Holotype: UF 175028; collected 19 Oct 1970 by Fred G. Thompson. Paratypes: UF

Table 1.—Shell parameters for *Aroapyrgus polius*. \bar{X} = mean, *SD* = standard deviation.

	SH	SW	ApH	ApW	Wh	$\frac{SW}{SH}$	$\frac{ApH}{SH}$	$\frac{ApW}{ApH}$
Holotype	3.7	2.1	1.4	1.1	5.4	0.57	0.37	0.82
Paratypes, <i>n</i> = 11								
\bar{X}	3.2	1.9	1.3	1.1	4.9	0.59	0.39	0.83
<i>SD</i>	0.2	0.1	0.1	0.1	0.2	0.03	0.01	0.03
Minimum	2.9	1.8	1.2	1.0	4.6	0.52	0.37	0.80
Maximum	3.4	2.1	1.4	1.1	5.4	0.63	0.41	0.85

174989, USNM 860566, numerous specimens; same data as the holotype. The pool at the type locality was less than two meters deep with a soft silt bottom, and was congested with thick mats of *Chara*. The water was clear and had a strong odor of hydrogen sulfide. Snails were collected by washing *Chara*.

Remarks.—The genus *Aroapyrgus* includes numerous species, and is widespread from southern Ecuador and the Amazon basin of Brazil north to Veracruz, Mexico. The various species exhibit a diverse array of shell forms, varying from depressed-globose to ovate-conic. *Aroapyrgus polius* is distinguished from all other congeners by its narrow, elongate shape: shells of other congeners range from depressed-globose to ovate-conic. No close affinities within the genus are apparent at present.

Etymology.—The species name *polius* is from the Classical Greek *polios*, meaning ashy gray, and refers to the shell color.

Cochliopa perforata, new species

Fig. 2, Table 2

Description.—Shell thick; periostracum yellow-green; columellar margin of aperture opaque white. Large, 3.5–4.3 mm tall; depressed-ovate; width/height, 79–95%; body whorl width 73–86% of height. Spire very low, broadly conical. Whorls 4.2–5.1; suture weakly impressed; apical whorl 0.12–0.15 mm in diameter. Umbilicus perforate; base of last whorl with a blunt, low spiral crest around the umbilical region; crest may be obsolete except near the peristome. Sculpture consisting of fine collabral striations over most of shell; circum-umbilical region within spiral crest having a few weak raised spiral lirae that may be broken into spiral series of small papillae. Aperture strongly prosocline, inclined 38–42° to coiling axis. Aperture 60–79% of shell height, and 65–81% of body whorl height. Aperture ovate; posterior corner angular and sulcate. Peristome complete across parietal wall at ma-

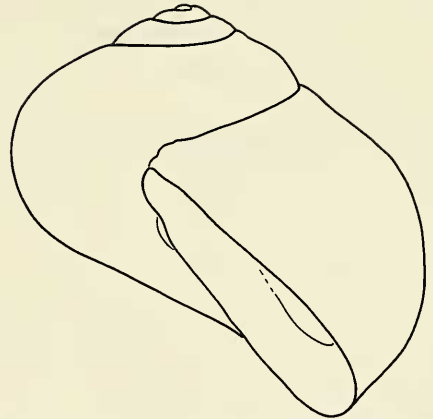


Fig. 2. *Cochliopa perforata*, new species, holotype, UF 175911. Shell height, 4.1 mm.

turity; parietal callus thick, opaque; outer lip thin, sharp; columellar margin thick, rounded.

Type locality.—A small stream 1 km northwest of the Bay of Golfito, Puntarenas Province, Costa Rica. Holotype: UF 175911; collected 27 Jul 1964 by Fred G. Thompson. Paratypes: UF 38504, USNM 850565, numerous specimens; same data as the holotype. The stream was about 5 m wide and up to one meter deep, with clear water and a gravel bottom. *Cochliopa perforata* was common, but patchy, on grass roots along the shore of the stream. It was

Table 2.—Shell parameters for *Cochliopa perforata*. \bar{X} = mean, *SD* = standard deviation.

	SH	HBW	SW	ApH	ApW	Wh	$\frac{SW}{SH}$	$\frac{WBW}{HBW}$	$\frac{ApH}{SH}$
Holotype	4.1	3.7	4.5	2.5	2.4	4.25	0.91	0.81	0.61
Paratypes, <i>n</i> = 12									
\bar{X}	3.9	3.6	4.5	2.6	2.4	4.9	0.86	0.79	0.67
<i>SD</i>	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Minimum	3.5	3.3	4.2	2.4	2.3	4.7	0.79	0.73	0.60
Maximum	4.3	4.0	4.7	2.9	2.5	5.1	0.95	0.86	0.79

found only within 200 m of the mouth of the stream above the bay.

Distribution.—Known only from small streams near Golfito, Puntarenas Province, Costa Rica. We have examined other specimens from the following localities: stream 7.5 km northeast of Golfito (UF 38607); small stream at northeast corner of bay, Golfito (UF 38589).

Remarks.—*Cochliopa* includes four described species (Hershler & Thompson 1991). All but *C. perforata* occur in Panama. The latter is distinct because of its large size, low spiral crest on the base of the last whorl, perforate umbilicus, and spiral threads in the circum-umbilical region. Other described species are smaller, imperforate or only narrowly rimate, lack a basal crest, and lack spiral sculpture.

Etymology.—The species name *perforata* is derived from the Latin *perforare*, to bore through, and refers to the umbilical opening.

Helebops clytus, new species

Fig. 3, Table 3

Description.—Shell conical in shape; width/height, 49–58%. Sexually dimorphic in size; females about 3.2–4.2 mm long and with 5.1–6.0 whorls; males about 2.7–2.9 mm long and with 3.7–4.2 whorls. Suture very weakly impressed. Spire straight-sided or weakly concave in outline. Apical whorl protruding, 0.23–0.24 mm in diameter. Shell translucent, light gray. Sculpture of fine col-

labral striations and sparse, very fine spiral striations. Umbilicus imperforate. Aperture width/height, 69–83%; height 40–46% of shell height. Prosocline, apertural plane inclined about 20° to coiling axis. Peristome incomplete across parietal margin; outer lip arched forward slightly when viewed in lateral profile.

Type locality.—Spring 2 km east-southeast of Duverge, Independencia Province, Dominican Republic. Holotype: UF 175170; collected 6 Feb 1976 by Fred G. Thompson and Beverly E. Johnson. Paratypes: UF 135428, USNM 860564, numerous specimens; same data as the holotype. The type locality is a small seepage spring run about one meter wide and less than 0.5 m deep. Snails were collected by washing mats of filamentous algae.

Distribution.—The species is common in the Lago de Enriquillo drainage. We have examined specimens from the following localities. Dominican Republic. Independencia Province: spring 5.0 km west-northwest of Duverge (UF 174881); spring 6.0 km west-northwest of Duverge (UF 174884); spring 1.0 km west of Las Baitoas (UF 174887); spring, Boca de Cachon (UF 174891); spring along north shore of Lago de Enriquillo, 4.0 km east of La Descubierta (UF 174894); spring 4.0 km east-northeast of Neiba (UF 174896).

Remarks.—This species is very similar in appearance to *Helebops docimus* Thompson, 1968 from Florida. Its shell differs from the latter by having a slightly less impressed

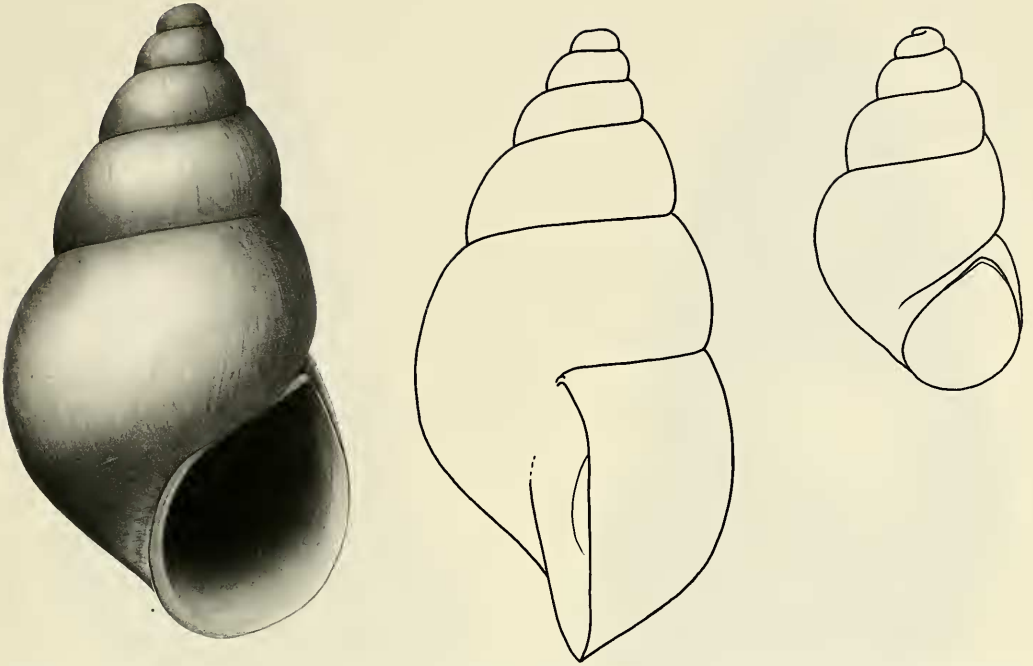


Fig. 3. *Heleobops clytus*, new species. The holotype, UF 175170 (4.1 mm), is shown on the left (both views) while a small paratype male, UF 135428, is shown to the right (same scale as above).

suture, although this distinction is hardly sufficient to warrant specific recognition. It differs anatomically by various features of the male penis. The penis is stout and cylindrical with three–five apocrine glands along the outer curvature, and with a small terminal papilla. The distal-most gland usu-

ally is separated from the others and is raised slightly higher. The penis lacks a basal expansion along the outer curvature, and lacks a lobe along the inner curvature near the terminus. In *H. docimus* the penis is long and tapered distally, and has a conspicuous swelling at the base along the outer curva-

Table 3.—Shell parameters for *Heleobops clytus*. \bar{X} = mean, *SD* = standard deviation.

	SH	SW	ApH	ApW	Wh	$\frac{SW}{SH}$	$\frac{ApH}{SH}$	$\frac{ApW}{ApH}$
Holotype	4.1	2.2	1.7	1.3	5.5	0.54	0.42	0.76
Paratypes, ♀, <i>n</i> = 16								
\bar{X}	3.8	2.0	1.6	1.2	5.8	0.52	0.42	0.73
<i>SD</i>	0.3	0.1	0.1	0.1	0.2	0.0	0.0	0.0
Minimum	3.2	1.7	1.5	1.1	5.1	0.47	0.40	0.69
Maximum	4.2	2.2	1.7	1.3	6.0	0.56	0.46	0.83
Paratypes, ♂, <i>n</i> = 12								
\bar{X}	2.8	1.5	1.2	1.0	4.0	0.55	0.45	0.77
<i>SD</i>	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0
Minimum	2.7	1.5	1.2	0.9	3.7	0.52	0.44	0.75
Maximum	2.9	1.6	1.3	1.0	4.2	0.58	0.46	0.79

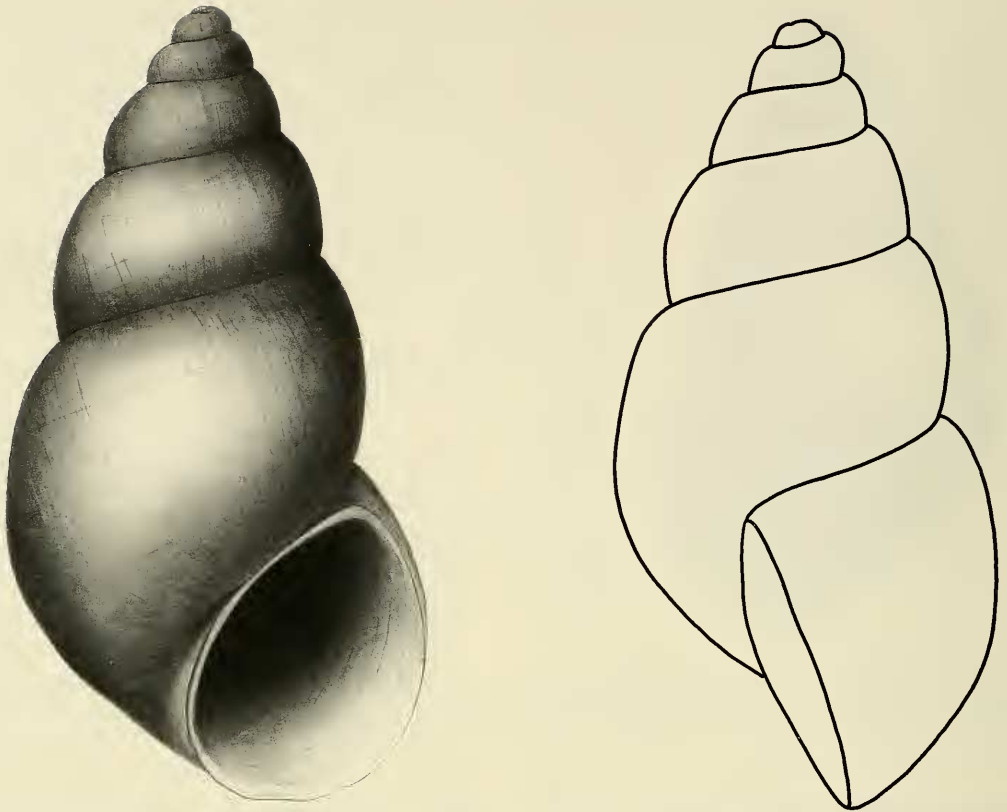


Fig. 4. *Pyrgophorus coronatus bermudezi* (Aguayo), UF 175165, spring 2 km east-southeast of Duverge, Independencia Province, Dominican Republic. Shell height, 3.7 mm.

ture. It bears a large lobe along the inner curvature near the terminus, which causes the penis to appear bifurcate. It has two-five apocrine glands along the right margin near the base and a terminal papilla.

Helebops clytus was found with *Pyrgophorus coronatus bermudezi* (Aguayo, 1947). The latter was described from Pleistocene specimens from Lago de Enriquillo and is common both in the lake and in springs draining to the lake. The holotype is an obese individual with spines on the periphery of the shell, as occurs in some individuals of most forms of *Pyrgophorus*. Most specimens of *bermudezi* lack spines and are more slender. Such specimens are very similar in shell features to *H. clytus*, except that the whorls are more rotund with a deeper suture, the peristome is complete in adults,

and the umbilicus is narrowly rimate (Fig. 4).

Etymology.—The genus name *Helebops*, originally treated as feminine (Thompson 1968:22), herein is amended to masculine gender in accordance with ICZN Article 30 (ii). The species name *clytus* is from the Classical Greek *klytos*, meaning renowned, and refers to the fact that the species is from the first land in the New World discovered by eastern explorers.

Helebops torquatus, new species
Fig. 5, Table 4

Description.—Shell sexually dimorphic. Females elongate-conic with attenuated apex; spire nearly straight-sided. Mature shells 2.7–3.2 mm tall; width/height, 47–

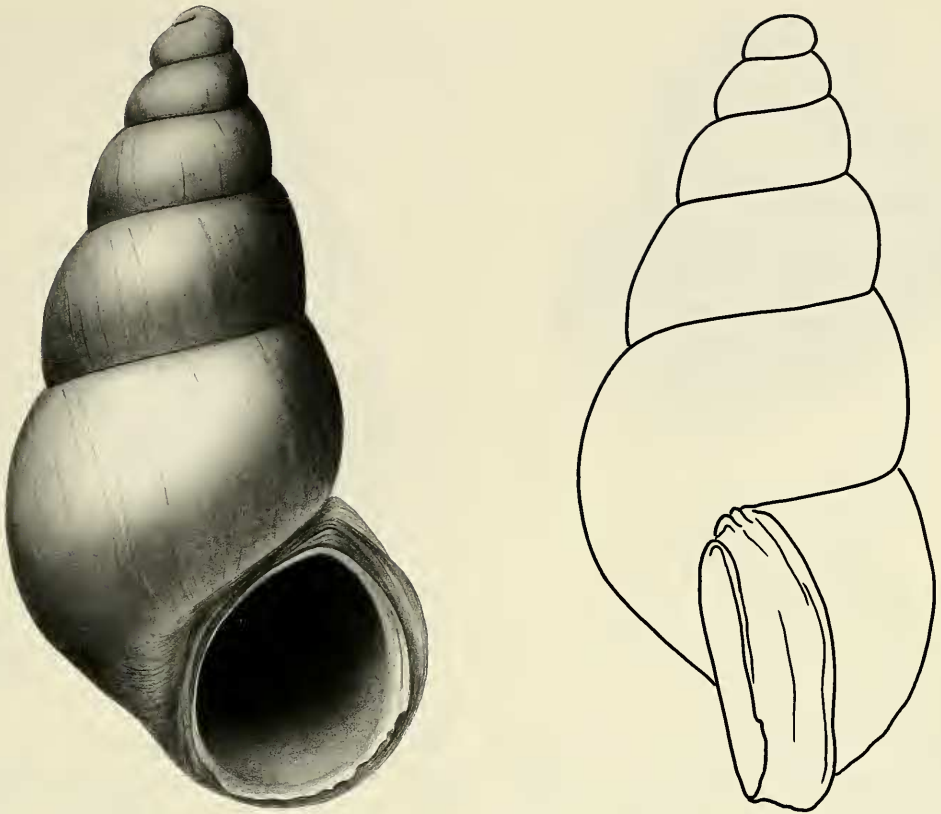


Fig. 5. *Heleobops torquatus*, new species, holotype, UF 175256. Shell height, 2.9 mm.

53%. Adults having 5.4–6.0 whorls. Body whorl with a heavy varix forming a collar behind aperture. Apical whorl strongly protruding; 0.23–0.25 mm in diameter. Suture

on subsequent whorls strongly impressed. Periostracum light gray. Shell transparent; smooth, with very faint microsculpture of collabral striations and weaker spiral stri-

Table 4.—Shell parameters for *Heleobops torquatus*. \bar{X} = mean, SD = standard deviation.

	SH	SW	ApH	ApW	Wh	$\frac{SW}{SH}$	$\frac{ApH}{SH}$	$\frac{ApW}{ApH}$
Holotype	2.9	1.3	1.0	0.84	6.0	0.45	0.34	0.84
Paratypes, ♀, $n = 10$								
\bar{X}	2.8	1.5	0.93	0.81	5.6	0.52	0.33	0.86
SD	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Minimum	2.4	1.3	0.84	0.71	5.4	0.47	0.30	0.81
Maximum	3.2	1.6	0.99	0.87	6.0	0.53	0.34	0.90
Paratypes, ♂, $n = 10$								
\bar{X}	2.3	1.2	0.81	0.65	5.0	0.55	0.36	0.81
SD	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1
Minimum	2.1	1.1	0.74	0.59	4.8	0.50	0.32	0.70
Maximum	2.4	1.4	0.84	0.68	5.2	0.57	0.40	0.85

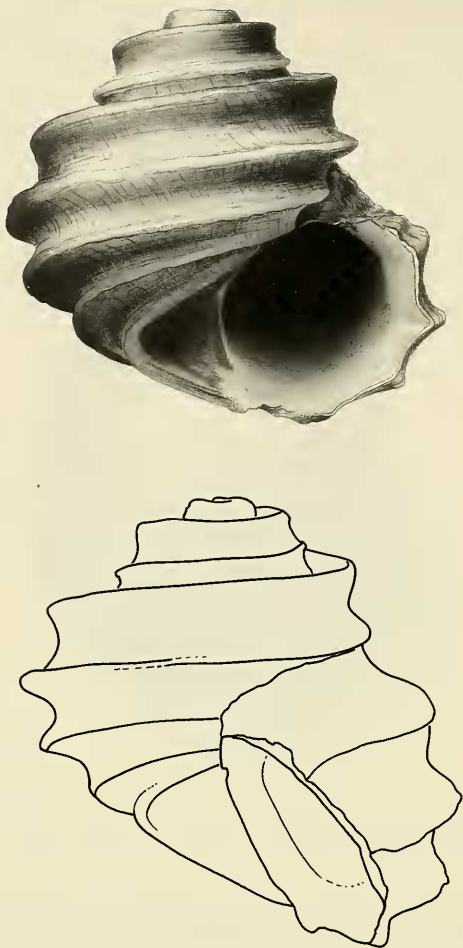


Fig. 6. *Lithococcus aletes*, new species, holotype, UF 36378. Shell height, 2.4 mm.

ations. Immature shells imperforate; mature shells rimate behind columellar lip. Aperture ovate; width/height, 81–90%; height 30–34% of shell height; posterior corner weakly angled. Peristome thick; complete across parietal margin where it forms a heavy parietal callus. Males similar to females but smaller and tending to be ventricose; 2.1–2.4 mm long and with 4.8–5.2 whorls.

The measured (below) height and width of shell include the expansion of the collar-like callus behind the peristome. The height and width of the aperture were determined from the outer edges of the peristome.

The penis is a simple, elongate, blade-like structure lacking an expansion at the base of the outer curvature and a non-glandular lobe on the inner curvature near the terminus. It also lacks a terminal papilla. The outer curvature bears only two apocrine glands.

Type locality.—A marshy stream 2.6 km northeast of Snipe, St. Elizabeth Parish, Jamaica. Holotype: UF 175256; collected 31 Aug 1976 by Fred G. Thompson. Paratypes: UF 135427, USNM 860567, numerous specimens; same data as the holotype. The stream was clear and about one meter deep with a fine silt bottom over clay and limestone. *Heleobops torquatus* was collected by sifting aquatic vegetation.

Remarks.—This species is readily distinguished from other known *Heleobops*, as well as all other West Indian Hydrobiidae, by the collar-like varix behind the aperture. The male penis also is unique within the genus.

Etymology.—The species name is derived from the Latin, *torquatus*, meaning adorned with a collar or necklace.

Lithococcus aletes, new species

Fig. 6

Description.—Shell very small for genus, broadly ovate, slightly wider than high. Periostracum light brown. Narrowly umbilicate. Whorls, 4.0. Apical whorl planular. Protoconch consisting of a single whorl; rounded; sculptured with fine collabral striations. Teleoconch bearing six heavy spiral crests. Superimposed on and between these are numerous fine spiral threads and coarser, uneven transverse threads. Uppermost crest forming a dished shoulder on the whorls. Second crest largest and forming periphery of shell. Lower four crests diminishing in size toward the base. Aperture slightly wider than high; prosocline at an angle of 30° to coiling axis. Peristome complete across parietal wall and broadly adnate to previous whorl; outer and basal margins

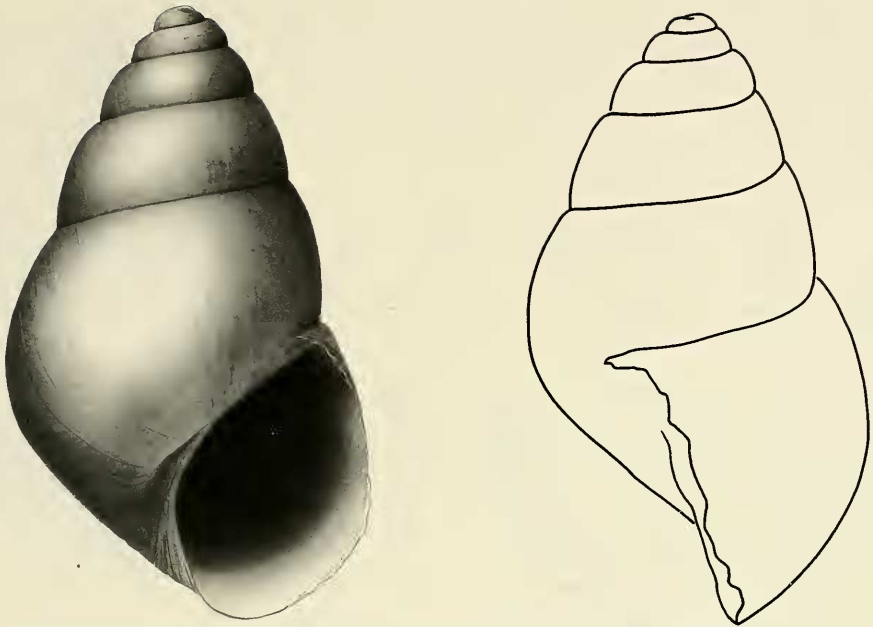


Fig. 7. *Littoridina microcona*, new species, holotype, UF 175912. Shell height, 2.9 mm.

very thick. Shell height, 2.4 mm; shell width, 2.5 mm; aperture height, 1.1 mm; aperture width 1.2 mm.

Type locality.—Rio Baru, 0.5 km above mouth of river, Dominical, Puntarenas Province, Costa Rica. Holotype: UF 36378; collected 12 Jul 1963 by Fred G. Thompson.

Remarks.—This species differs from other *Lithococcus* by its much smaller size, and the smooth crests on the surface of the shell whorls. *Lithococcus multicarinatus* (Miller, 1879) and *L. venustus* Pilsbry, 1950 are about 10 mm in diameter as adults, and have spiral series of knobs on the crests forming a multiple corona on the shell.

This species is known only from the holotype. It is described because it adds greatly to the known geographic distribution of the genus, and because of the distinctiveness of its shell. The microsculpture of the shell leaves little doubt about its generic assignment. The holotype was found in debris on the bottom of a quiet pool at the side of the Rio Baru, along with numerous live *Cochli-*

opa and *Zetekina*. The Rio Baru is a high-gradient river whose headwaters originate at about 3000 m elevation. The river lies below 100 m only along the lower 4–5 km of its course, where it consists of series of rocky rapids separated by quieter sand- and gravel-bottomed pools. The shell probably was washed downstream from a population living at higher elevation. Such an occurrence would be consistent with the known ecology of other *Lithococcus*, which occur in low-gradient freshwater zones of rivers above the influence of tidal fluctuations.

Etymology.—From *aletes*, Greek, a va-grant, and referring to the origin of the holotype.

Littoridina microcona, new species
Fig. 7, Table 5

Description.—Small, about 2.4–2.9 mm long; conical; width/height, 49–58%. Apex depressed, rounded; first whorl (apex) weakly protruding; spire convex in outline along earlier whorls; last two whorls nearly flat-

Table 5.—Shell parameters for *Littoridina microcona*. \bar{X} = mean, SD = standard deviation.

	SH	SW	ApH	ApW	Wh	$\frac{SW}{SH}$	$\frac{ApH}{SH}$	$\frac{ApW}{ApH}$
Holotype	2.9	1.7	1.3	1.0	6.0	0.58	0.44	0.76
Paratypes, $n = 10$								
\bar{X}	2.6	1.5	1.1	0.9	4.8	0.57	0.44	0.75
SD	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Minimum	2.4	1.4	1.1	0.8	4.5	0.49	0.42	0.71
Maximum	2.9	1.6	1.3	0.9	5.0	0.53	0.46	0.81

sided; last whorl with a weak peripheral keel. Whorls, 4.5–5.0; apical whorl 0.15–0.16 mm in diameter. Periostracum grayish-yellow. Sculpture of very fine collabral striations and finer, sparse spiral microstriations. Umbilicus rimate; partially obstructed by reflected columellar lip. Aperture ovate; width/height, 71–81%; height 42–46% of shell height. Plane of aperture inclined 27–28° to coiling axis. Peristome thin, sharp, incomplete across parietal margin.

Type locality.—Marshy pool 1.0 km north of Boca de Barranca, Puntarenas Province, Costa Rica. Holotype: UF 175912; collected 19 Jun 1963 by Fred G. Thompson. Paratypes: UF 37799, USNM 860568, numerous specimens; same data as the holotype. The pool was about 10–30 cm deep with a mud-gravel bottom. The water was slightly brackish and turbid with visibility restricted to only a few centimeters. Snails were found crawling on dead grasses in shallow water.

Remarks.—*Littoridina* includes four known species: *L. quadichaudi* Souleyet, 1852; *L. crosseana* (Pilsbry, 1910); *L. orcutti* (Pilsbry, 1928); and the novelty described herein. Most other hydrobiids referred to *Littoridina* now are placed in *Heleobia* (Hershler & Thompson 1991). *Littoridina microcona* is similar in shell shape to *L. quadichaudi* from Ecuador. It differs from all *Littoridina* by its very small size and rather blunt apex. The penis most resembles that of *L. orcutti* from southwestern Mexico by having a single papilla

along the inner curvature that bears numerous smaller glandular papilla. It differs from *L. orcutti* also by having several small, slender papillae along the outer curvature near the base.

Etymology.—The species name *microcona* refers to the small cone-shaped shell of this snail.

Mesobia, new genus

Type species.—*Mesobia pristina*, new species.

Description.—Shell slender; sexually dimorphic in shape and size. Adult females elongate-conic, about 2.8–3.0 mm long and with about five whorls. Adult males about half as long as females, more broadly conical in shape and with about 3.5 whorls. Apical whorl protruding, about 0.25 mm in diameter. Teleoconch suture deeply impressed. Protoconch slightly wrinkled. Teleoconch sculpture of collabral striations. Peristome complete in adult specimens, simple. Aperture nearly round. Umbilical perforation open. Operculum broadly ovate, paucispiral. Central radular teeth with 2 pairs of basal cusps inserting into lateral angles; lateral angles moderately expanded, ventral process well excavated. Animal pale, epithelial pigment typically restricted to digestive gland. Dorsal surfaces of cephalic tentacles with longitudinal ciliary tracts; left tentacles having transverse ciliary bands. Ctenidial filaments about 35. Osphradium about 33% of ctenidial length. Stomach without posterior caecal chamber. Females

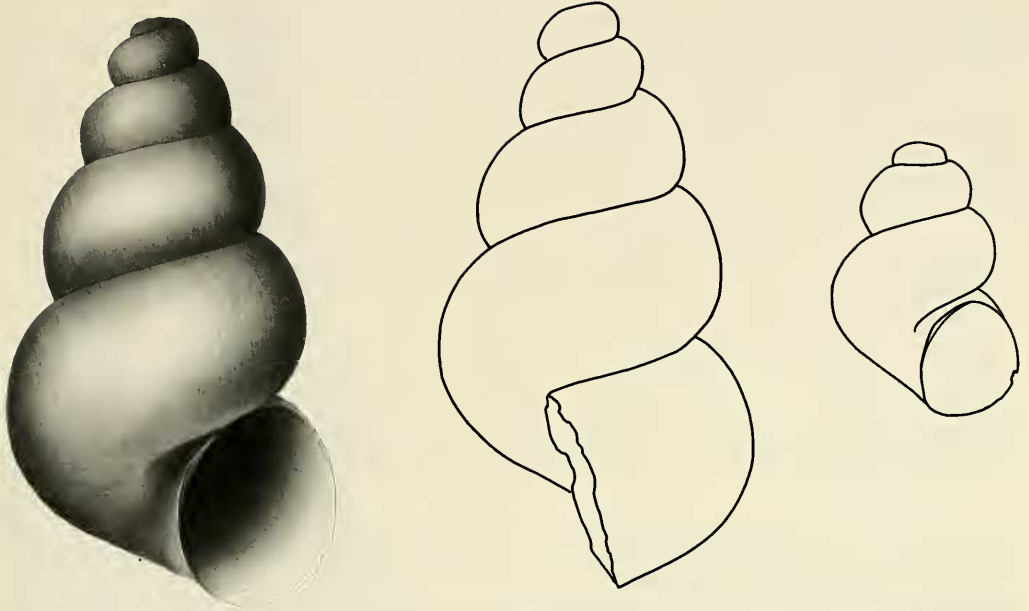


Fig. 8. *Mesobia pristina*, new genus and new species. The holotype, UF 175031 (2.8 mm), is shown on the left (both views) while a small paratype male, UF 40421, is shown to the right (same scale as above).

ovoviviparous. Small, simply lobate ovary lying against posterior edge of stomach. Capsule gland an enlarged, thin-walled, brood pouch having slightly muscularized opening. Albumen gland small, folded lateral to capsule gland. Sperm sacs small, pouch-like, broadly overlapping, pressed against left side of albumen gland. Ducts of sperm sacs long, narrow. Duct of seminal receptacle connecting to oviduct just distal to point where latter opens into albumen gland; distal to this a short fertilization duct connects with distal end of duct of bursa copulatrix. Sperm tube short, non-muscular. Embryos numerous, small-sized. Small, simply lobate testis lying against posterior edge of stomach. Prostate gland small, almost entirely non-pallial; vas deferens exiting just proximal to anterior tip of gland. Penis moderate-sized, narrow, with slender non-glandular lobe issuing from inner curvature near distal tip; tip blunt, with terminal papilla. Penis bearing single, small, apocrine glands on outer and inner curvature basally.

Remarks.—Although the shell of *Mesobia* resembles that of *Durangonella*, characteristics of genitalia preclude a close relationship. The presence of apocrine glands on the penis places *Mesobia* in the group of *Heleobia* and related genera. While the penis of *Mesobia* closely resembles those of some *Heleobops*, the former is distinguished from all other genera in this group by its ovoviviparous reproductive mode, and by females having a prominently twisted albumen gland and very small sperm pouches.

Mesobia pristina, new species
Fig. 8, Table 6

Description.—Shells sexually dimorphic. Females slender; elongate-conic; about 2.8–3.2 mm long; width/height, 49–59%. Spire nearly straight-sided or weakly convex in outline. Thin and transparent. Periostracum light grayish-brown. Teleoconch sculpture of very fine collabral striations. Apical whorl protruding, 0.24–0.26 mm in diam-

Table 6.—Shell parameters for *Mesobia pristina*. \bar{X} = mean, SD = standard deviation.

	SH	SW	ApH	ApW	Wh	$\frac{SW}{SH}$	$\frac{ApH}{SH}$	$\frac{ApW}{ApH}$
Holotype	2.8	1.5	0.91	0.75	5.0	0.55	0.32	0.83
Paratypes, ♀, $n = 13$								
\bar{X}	2.9	1.5	0.92	0.78	5.0	0.53	0.32	0.85
SD	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Minimum	2.8	1.4	0.87	0.74	4.8	0.49	0.30	0.80
Maximum	3.2	1.6	0.96	0.81	5.3	0.59	0.34	0.93
♂, $n = 10$								
\bar{X}	1.5	1.0	0.64	0.56	3.5	0.66	0.43	0.85
SD	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0
Minimum	1.4	0.9	0.59	0.50	3.2	0.60	0.40	0.81
Maximum	1.6	1.1	0.68	0.59	3.9	0.69	0.46	0.90

eter. Whorls 4.8–5.3 in adults; suture deeply impressed. Umbilicus broadly perforate; opening partially obstructed by columellar margin of peristome. Aperture height 30–34% of shell height; broadly ovate, width/height, 80–93%; posterior corner broadly rounded, not angular. Apertural plane inclined 21–22° to coiling axis. Peristome complete across parietal margin of aperture and narrowly in contact with or occasionally free from previous whorl. Lip thin and sharp; simple, not reflected nor with internal callosity; outer basal margin slightly advanced. Males smaller than females, about 1.4–1.6 mm long; more broadly conic, width/height, 60–69%. Whorls fewer, 3.2–3.9 in adults; last whorl tending to become ventricose. Aperture relatively larger and more nearly rounded; height 40–46% of shell height; height/width, 81–90%; nearly always solute from previous whorl in adults.

Type locality.—Lago de Yajoa, at the north side of an island near Agua Azul, Cortez Province, Honduras. Holotype: UF 175031; collected 29 Aug 1964 by Fred G. Thompson. Paratypes: UF 40421, USNM 860569, numerous specimens; same data as the holotype. The type locality is a small cove on the north side of a small island near Agua Azul. The water was about 3 m deep and was clear to the bottom. Snails were

collected by washing filamentous algae. The algae formed large floating mats amid aquatic angiosperms of the genera *Nuphar*, *Eichornia*, *Myriophyllum*, *Utricularia* and *Scirpus*.

Etymology.—The name *Mesobia* (feminine) is taken from Meso America and the Classical Greek *bios*, and refers to the geographic occurrence of the genus. The species name *pristina* is from the Latin *pristinus*, meaning primitive, and refers to the relationship of *Mesobia* to *Heleobia* and allies.

Texapyrgus, new genus

Type species.—*Texapyrgus longleyi*, new species.

Description.—Shell minute, elongate-conic to turreted. Apical whorl protruding, about 0.16 mm in diameter perpendicular to initial suture. Teleoconch sutures deeply impressed. Protoconch surface coarsely wrinkled. Teleoconch sculpture of numerous, strong, evenly spaced spiral lines; colabral striations weaker. Peristome complete in adult specimens, simple. Aperture ovate. Umbilical perforation open. Operculum broadly ovate, paucispiral. Central radular teeth with single pair of large basal cusps inserting into region where lateral angles originate. Lateral angles moderately ex-

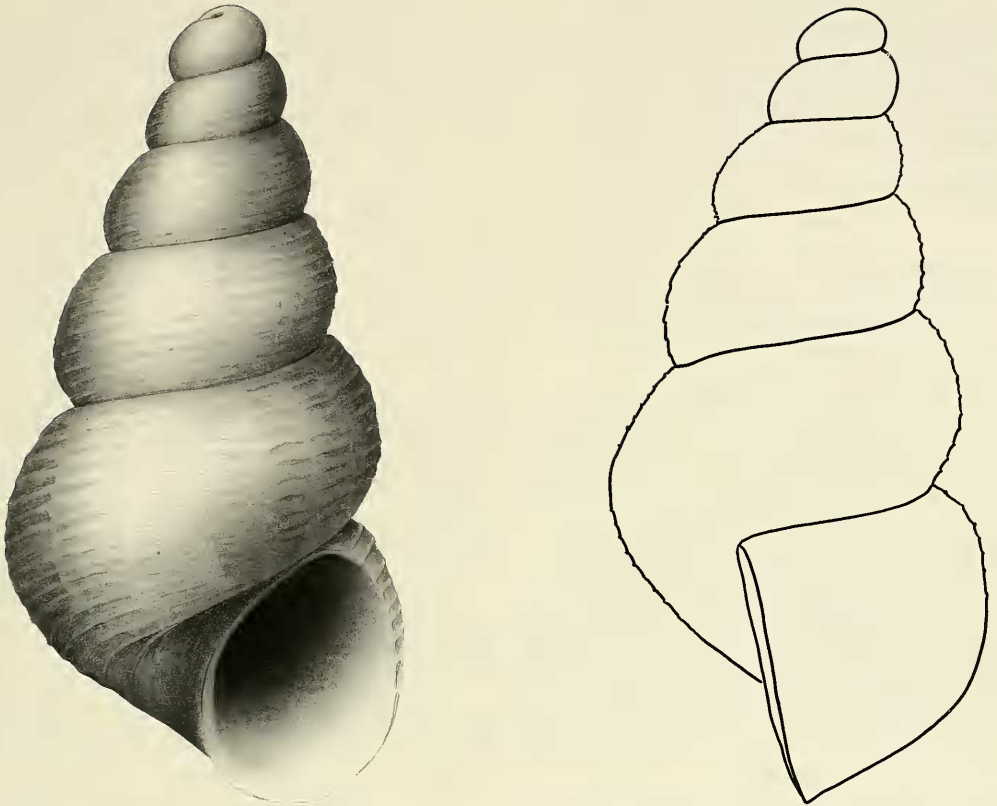


Fig. 9. *Texapyrgus longleyi*, new genus and new species, holotype, USNM 860551. Shell height, 1.6 mm.

panded; ventral process well excavated. Animal blind, unpigmented. Cephalic tentacles without ciliary bands or tracts. Ctenidial filaments about 10. Osphradium about a third as long as ctenidium, extending to near posterior end of ctenidium. Females oviparous. Ovary a large simple sac. Albumen gland with short posterior bend. Bursa copulatrix absent. Small seminal receptacle pressed against right side of coiled oviduct. Oviduct connecting with anterior edge of folded albumen gland via a short duct and coursing anteriorly as non-muscular sperm tube. Short duct from seminal receptacle opening into oviduct slightly anterior to above. Sperm tube joining anterior capsule gland; genital aperture slightly muscularized. Testis of numerous, simple lobes posterior to stomach. Prostate gland small, with very

shortpallial portion; vas deferens exiting from base of blunt anterior edge of gland. Penis elongate, tapering, with single stalked apocrine gland on outer curvature near mid-length.

Remarks.—The presence of an apocrine gland on the penis places *Texapyrgus* in the group of *Heleobia* and related genera. *Texapyrgus* most closely resembles *Balconorbis* anatomically, but differs in various shell features and by females having a sperm pouch.

Texapyrgus longleyi, new species
Fig. 9, Table 7

Description.—Shell height, 1.4–1.8 mm. Male shells slightly smaller and narrower than those of females. Spire nearly straight,

Table 7.—Shell parameters for *Texapyrgus longleyi*. \bar{X} = mean, SD = standard deviation.

	SH	SW	ApH	ApW	Wh	SW SH	ApH SH	ApW ApH
Holotype	1.6	0.82	0.50	0.40	5.5	0.51	0.31	0.80
Paratypes, $n = 9$								
\bar{X}	1.5	0.77	0.47	0.39	5.2	0.53	0.32	0.84
SD	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.0
Minimum	1.4	0.69	0.42	0.36	5.0	0.51	0.30	0.77
Maximum	1.6	0.85	0.53	0.46	5.5	0.55	0.34	0.90

although sometimes slightly concave or convex depending on position of body whorl. Thin and transparent. Periostracum light brown. Protoconch, 1.0–1.25 whorls, protruding, slightly tilted, with strongly wrinkled surface that becomes smooth on early teleoconch; protoconch diameter, about 0.16 mm. Spiral lines prominent on teleoconch, crossed occasionally by strong collabral striae. Twenty–thirty spiral lines on body whorl, extending from suture into umbilical area. Whorls, 5.0–5.5 in adults; sutures deeply impressed. Umbilicus perforate; opening sometimes constricted by columellar margin of aperture. Aperture 30–34% of shell height, broadly ovate, width/height, 77–90%; broadly rounded below, slightly angled above. Apertural plane near parallel to coiling axis. Peristome complete across parietal margin and narrowly in contact with previous whorl. Lip thin, sharp, very slightly reflected along inner margin.

Type locality.—Spring on east side of Devils River in canyon just downflow from Slaughter Bend, Amistad National Recreation Area, about 32 km north of Del Rio, Val Verde County, Texas, United States (Hershler & Longley 1987, fig. 2). Holotype: USNM 860551; collected by R. Hershler and Susannah Corona, Aug 1986 (from series of pooled samples). Paratypes: UF 172632, USNM 860552, numerous specimens; same data as the holotype. The type locality is a small rheocrene discharging directly into the Devils River. The spring had a gravel bottom and lacked aquatic vege-

tation. Snails and other phreatic animals were collected by placing a fine mesh net into the main spring orifice and then periodically removing and washing the net. Other phreatic fauna included *Phreatodrobia coronae* Hershler & Longley, 1987 and various crustaceans.

Etymology.—The name *Texapyrgus* (masculine) is taken from Texas and the Classical Greek *pyrgos*, meaning tower, and refers to the geographical occurrence of the genus and its elongate shell. The species is named after Glenn Longley of the Edwards Aquifer Research and Data Center (Southwest Texas State University), who provided logistical support for the second author's fieldwork in Texas.

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Literature Cited

- Aguayo, C. G. 1947. Notes y Variedades (VIII).—*Revista de la Sociedad Malacologica "Carlos de la Torre"* 5:81–83.
- Golikov, A. N., & Y. I. Starobogatov. 1975. Systematics of prosobranch gastropods.—*Malacologia* 15:185–232.
- Hershler, R., & G. Longley. 1987. *Phreatodrobia co-*

- ronae*, a new species of cavesnail from south-western Texas.—*Nautilus* 101:133–139.
- , & F. G. Thompson. 1991. A review of the genera of the aquatic gastropod subfamily Cochliopinae (Prosobranchia: Hydrobiidae).—*Malacological Review* (in press).
- Loganzen, B. G., & Y. I. Starobogatov. 1982. A finding of a freshwater mollusc of the family Triculidae (Gastropoda, Prosobranchia) in Siberia.—*Zoologicheskyy Zhurnal* 61:1141–1147.
- Miller, K. 1879. Die Binnenmollusken von Ecuador.—*Malakozoologische Blätter* 1:117–203.
- Parodiz, J. J. 1969. The Tertiary non-marine Mollusca of South America.—*Annals of the Carnegie Museum* 40: 1–242.
- Pilsbry, H. A. 1910. New Amnicolidae of the Panuco River system, Mexico.—*Nautilus* 23:97–100.
- . 1928. Mexican mollusks.—*Proceedings of the Academy of Natural Sciences of Philadelphia* 80:115–117.
- . 1950. Fresh water mollusks from Colombia and Guatemala.—*Nautilus* 63:82–85.
- Ponder, W. F., & A. Warén. 1988. Appendix. Classification of the Caenogastropoda and Heterostropha—a list of the family-group names and higher taxa.—*Malacological Review, Supplement* 4:288–326.
- Souleyet, M. 1852. Mollusques. *In Voyage autour du monde execute Penant les annees 1836 et 1837 sur la corvette la bonite commandée par M. Vaillant Capitaine de Vaisseau Publié par ordre du gouvernement sous les auspices du département de la marin. Zoologie par M.M. Eydoux et Souleyet. Volume 2, Arthus Bertrand, Paris, 664 pp.*
- Thiele, J. 1928. Revision des systems Hydrobiiden und Melaniiden.—*Zoologische Jahrbucher* 55: 351–402.
- Thompson, F. G. 1968. The aquatic snails of the family Hydrobiidae of peninsular Florida.—*University of Florida Press, Gainesville, 268 pp.*
- Troschel, F. H. 1856–1863. *Das Gebiss der Schnecken zur Begründung einer Natürlichen Classification. Volume 1.—Nicolaische Verlagsbuchhandlung, Berlin, 252 pp.*
- Tryon, G. W. 1866. [Review of] Researches upon the Hydrobiinae and allied forms.—*American Journal of Conchology* 2:152–158.

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